General

Guideline Title

Recommendations for growth monitoring, and prevention and management of overweight and obesity in children and youth in primary care.

Bibliographic Source(s)

Canadian Task Force on Preventive Health Care. Recommendations for growth monitoring, and prevention and management of overweight and obesity in children and youth in primary care. CMAJ. 2015 Apr 7;187(6):411-21. [37 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The grades of recommendations (strong, weak) and grades of evidence (high, moderate, low, very low) are defined at the end of the "Major Recommendations" field.

Summary of Recommendations for Clinicians and Policy Makers

Growth Monitoring

This recommendation applies to all children and youth aged 17 years and younger who present to primary care.

- The Task Force recommends growth monitoring* at all appropriate† primary care visits using the 2014 World Health Organization (WHO) Growth Charts for Canada. (Strong recommendation; very low-quality evidence)

Prevention of Overweight and Obesity in Healthy-weight Children

This recommendation applies to all children and youth aged 17 years and younger who have a healthy weight (i.e., who maintain a healthy body mass index [BMI] trajectory according to the WHO Growth Charts for Canada). It does not apply to children and youth with eating disorders, or who are underweight, overweight or obese (see Table 1 in the original guideline document).

- The Task Force recommends that primary care practitioners not routinely offer structured interventions‡ aimed at preventing overweight and obesity in healthy-weight children and youth aged 17 years and younger. (Weak recommendation; very low-quality evidence)

Management of Overweight and Obesity

These recommendations apply to children and youth 2 to 17 years of age who are overweight or obese. Children and youth with health conditions for which weight management is inappropriate are excluded.

- The Task Force recommends that primary care practitioners offer or refer to structured behavioural interventions‡ aimed at healthy weight management. (Weak recommendation; moderate quality evidence)
- The Task Force recommends that primary care practitioners not offer orlistat aimed at healthy weight management for children aged 2 to 11 years. (Strong recommendation; very low-quality evidence)
- The Task Force recommends that primary care practitioners not routinely offer orlistat aimed at healthy weight management for youth aged 12 to 17 years. (Weak recommendation; moderate-quality evidence)
- The Task Force recommends that primary care practitioners not routinely refer for surgical interventions. (Strong recommendation; very low-quality evidence)

*Growth monitoring consists of measurement of height or length, weight, and BMI calculation or weight-for-length according to age.

†Appropriate primary care visits include scheduled health supervision visits, visits for vaccinations or medication renewal, episodic care or acute illness, and other visits where the primary care practitioner deems it appropriate. Primary care visits are completed by primary care practitioners at primary care settings, including those outside of a physician's office (e.g., public health nurses carrying out a well-child visit at a community setting).

‡Structured behavioural interventions are intensive behavioural modification programs that involve several sessions that take place over weeks to months, follow a comprehensive approach delivered by a specialized interdisciplinary team, involve group sessions, and incorporate family and parent involvement. Interventions examined included behaviourally based prevention interventions focused on diet, increasing exercise, making lifestyle changes or any combination of these. These can be delivered by a primary care team in the office or through a referral to a formal program within or outside of primary care, such as hospital-based, school-based or community programs.

Definitions

Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group Grades of Evidence

High quality — Further research is very unlikely to change confidence in the estimate of effect.
Moderate quality — Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
Low quality — Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
Very low quality — The Task Force is very uncertain about the estimate.

Grading of Recommendations

- Strong recommendations are those for which the Task Force is confident that the desirable effects of an intervention outweigh its undesirable effects (strong recommendation for an intervention) or that the undesirable effects of an intervention outweigh its desirable effects (strong recommendation against an intervention). A strong recommendation implies that most individuals will be best served by the recommended course of action.
- Weak recommendations are those for which the desirable effects probably outweigh the undesirable effects (weak recommendation for an intervention) or undesirable effects probably outweigh the desirable effects (weak recommendation against an intervention) but appreciable uncertainty exists. A weak recommendation implies that most people would want the recommended course of action but that many would not. For clinicians this means they must recognize that different choices will be appropriate for each individual, and they must help each person arrive at a management decision consistent with his or her values and preferences. Policy-making will require substantial debate and involvement of various stakeholders. Weak recommendations result when the balance between desirable and undesirable effects is small, the quality of evidence is lower, or there is more variability in the values and preferences of patients.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Overweight and obesity

Guideline Category

Management

Prevention

Clinical Specialty

Family Practice

Internal Medicine

Pediatrics

Preventive Medicine

Intended Users

Advanced Practice Nurses

Health Care Providers

Nurses

Physician Assistants

Physicians

Public Health Departments

Guideline Objective(s)

To provide recommendations for growth monitoring and prevention of overweight and obesity in healthy-weight children and adolescents aged 17 years and younger in primary care settings, and guidance for primary care practitioners on the effectiveness of overweight and obesity management in children and youth aged 2 to 17 years

Target Population

- Children and adolescents aged 17 years and younger in primary care settings who have a healthy weight (i.e., who maintain a healthy body mass index [BMI] trajectory according to the World Health Organization [WHO] Growth Charts for Canada [www.whogrowthcharts.ca])
- Overweight and obese children and youth aged 2 to 17 years

Interventions and Practices Considered

1. Growth monitoring using the 2014 World Health Organization (WHO) Growth Charts for Canada
2. Structured behavioral interventions aimed at weight management

Note: The following interventions were considered but were recommended against:

- Routine use of structured interventions aimed at preventing overweight and obesity in healthy-weight children aged 17 years and younger
- Orlistat aimed at healthy weight management for children aged 2 to 11 years
- Routine use of orlistat aimed at healthy weight management for youth aged 12 to 17 years
- Routine referrals for surgical interventions

Major Outcomes Considered

Primary Outcomes

- Change in body mass index (BMI)
- BMI Z-score (BMIz)
- Prevalence of overweight and obesity

Secondary Outcomes

- Changes in total cholesterol, triglycerides
- High-density–lipoprotein (HDL) and low-density–lipoprotein (LDL)
- Systolic and diastolic blood pressure
- Overall quality of life
- Physical fitness

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Searches of Unpublished Data

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): Two systematic evidence reviews were prepared by the McMaster Evidence Review and Synthesis Centre Team for the Canadian Task Force on Preventive Health Care (CTFPHC) (see the "Availability of Companion Documents" field).

Prevention of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

Search Strategy

For this review the review team updated the search conducted for the 2011 Cochrane review by Waters et al. For the key and supplemental questions they searched EMBASE, Medline, Cochrane Central Registry of Controlled Trials, PsycINFO and CINAHL from January 2010 (the date of the last Cochrane search) to August 1, 2013 using terms such as *obesity, overweight*, *health promotion*, *primary prevention*, *weight control*, *weight maintenance*, *behavior therapy*, *diet*, *exercise*, *fitness* and *lifestyle*. Reference lists of the included studies of this review and the included studies of other on topic reviews were searched for any relevant studies that were not captured by the search. A separate search was conducted to look for evidence that would answer the contextual questions; this strategy included two databases (Medline and EMBASE) and covered the period between January 2007 and August 16, 2013. The full search strategies are provided in Appendix 1 in the systematic review. In addition, a focused grey literature search of Canadian sources was undertaken for recent reports on obesity in Canada. All citations were uploaded to a web-based systematic review software program for screening and data extraction.

Study Selection

Titles and abstracts of papers considered for the key question (KQ) and sub-questions were reviewed in duplicate; any article marked for inclusion by either team member went on to full text screening. Full text inclusion was done independently by two people. All disagreements were resolved through discussions rather than relying on a particular level of kappa score to indicate when discussions were no longer necessary. The inclusion results were reviewed by a third person. For papers located in the contextual questions search, title and abstract screening was done by one person.

Inclusion and Exclusion Criteria

See Chapter 2 in the systematic review for details of the inclusion and exclusion criteria, including language, populations, interventions, settings, comparator and study design, outcome and timeframe.

Results

The Cochrane 2011 child obesity prevention review by Waters et al. was used as the foundation for this search. Therefore, the citations and articles the review team examined for inclusion were those found through their search, those included in the Cochrane 2011 review, and citations the Cochrane group were considering for inclusion in their updated review.

The search located 7,268 unique citations (see Figure 2 in the systematic review). At the time of conducting the review, the Cochrane group was updating their review and had updated their search to December 2012. From that search they shared with reviewers 50 citations they had yet to screen and 27 citations they had screened and identified for potential inclusion in their update.

The reviewers screened 7,268 citations from the search, as well as the 50 unscreened citations Cochrane shared with them for title and abstract relevance (7,318 citations in total). The reviews excluded 6,940 citations at this first level of screening. Of the 378 citations to be screened at full text, one could not be retrieved.

At the point of full text screening, the reviewers integrated 71 additional papers from the Cochrane group (the 37 studies included in the body mass index/body mass index Z-score [BMI/BMIz] meta-analysis of their 2011 review and 34 studies they were considering for inclusion in their update). They also integrated 20 hand searched articles that became companion papers for the included studies. Full text screening took place on 468 citations. Of these 468 citations, 60 were identified as systematic reviews and 285 did not meet the inclusion criteria and thus were excluded (see the list of excluded studies [see the "Availability of Companion Documents" field]).

At the end of the search and selection process, 90 studies with 123 papers met the inclusion criteria for this review. This total includes 28 studies brought forward from the 2011 Cochrane review, 16 studies the Cochrane group was considering for their update, 10 studies from the pool of as yet un-reviewed citations from the Cochrane group (some of which were also found by the reviewers' search), and 36 unique studies located in the more recent literature covered by the reviewers' search.

Treatment of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

Search Strategy

For this review the review team updated the search conducted for the 2010 U.S. Preventive Services Task Force (USPSTF) review. For the key and supplemental questions the reviewers searched EMBASE, Medline, Cochrane Central Registry of Controlled Trials, and PsycINFO from June 10, 2008 (the date of the last USPSTF search) to August 28, 2013, using terms such as *obesity*, *overweight*, *weight loss*, *weight maintenance*, *orlistat*, *behavior therapy*, *diet*, *exercise*, and *lifestyle*. Reference lists of the included studies of this review and the included studies of other on topic reviews were searched for any relevant studies that were not captured by the search. A separate search was conducted to look for evidence that would answer the contextual questions; this strategy included two databases (Medline and EMBASE) and covered the period between January 2007 and August 16, 2013. The full search strategies are provided in Appendix 1 in the systematic review. In addition, a focused grey literature search of Canadian sources was undertaken for recent reports on obesity in Canada. All citations were uploaded to a web-based systematic review software program for screening and data extraction.

Study Selection

Titles and abstracts of papers considered for the KQs and sub questions were reviewed in duplicate; articles marked for inclusion by either team member went on to full text screening. Full text inclusion was done independently by two people. All disagreements were resolved through discussions rather than relying on a particular level of kappa score to indicate when discussions were no longer necessary. The inclusion results were reviewed by a third person. For papers located in the contextual questions search, title and abstract screening was done by one person.

Inclusion and Exclusion Criteria

See Chapter 2 in the systematic review for details of the inclusion and exclusion criteria, including language, populations, interventions, settings, comparator and study design, outcome and timeframe.

Results

The search and selection process for relevant literature occurred in three stages. Initially reviewers conducted a combined search that included children and adults; prevention and treatment. They believed that some efficiency would be gained in the screening stage if they started with a comprehensive search strategy.

The initial comprehensive search (including both adults and children) located 30,196 unique citations (see Figure 2 in the systematic review). These citations were reviewed for title and abstract relevance and were filtered for population (adult or child) and intervention focus (prevention or treatment). A total of 10,914 were excluded at this first level of relevance screening. There were 8,099 citations streamed for children and 11,183 citations streamed for adult populations (further information regarding adult-related citations reported in the adult obesity treatment and adult obesity prevention reviews are available on the CTFPHC Web site http://canadiantaskforce.ca/).

The second stage involved another round of title and abstract screening and streaming of the 8,099 citations related to children. At this level 7,424 citations were excluded and 675 citations remained for consideration as treatment interventions.

Finally, the literature search was updated in August 2013. This updated search added an additional 2,041 citations for possible inclusion. Another round of title and abstract screening was undertaken where an additional 2,396 citations were excluded leaving 320 eligible for full text screening (one of these papers could not be retrieved). To the remaining search yield the reviewers added 15 of the 23 studies included the 2010 USPSTF review for consideration (they pre-emptively excluded the eight trials that examined sibutramine or metformin as the pharmacological intervention). Full text screening took place on 334 citations and 232 were excluded (see the list of excluded studies [see the "Availability of Companion Documents" field]).

Sixty-four systematic reviews were identified by the review team. The reference lists of recent (published in 2012 and 2013) and on topic systematic reviews were searched to ensure that they had not missed any relevant studies. No additional studies were located in those reference lists.

Number of Source Documents

Prevention of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

At the end of the search and selection process, 90 studies with 123 papers met the inclusion criteria for this review. This total includes 28 studies brought forward from the 2011 Cochrane review, 16 studies the Cochrane group was considering for their update, 10 studies from the pool of as yet un-reviewed citations from the Cochrane group (some of which were also found by the search), and 36 unique studies located in the more recent literature covered by the search.

Treatment of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

At the end of the search and selection process, 32 studies with 38 papers met the inclusion criteria for this review. This total includes nine studies brought forward from the 2010 U.S. Preventive Services Task Force (USPSTF) review that met the inclusion criteria and 23 studies found in the more recent literature.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group Grades of Evidence

High quality — Further research is very unlikely to change confidence in the estimate of effect.
Moderate quality — Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.

Low quality — Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
Very low quality — The Task Force is very uncertain about the estimate.

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): Two systematic evidence reviews were prepared by the McMaster Evidence Review and Synthesis Centre Team for the Canadian Task Force on Preventive Health Care (CTFPHC) (see the "Availability of Companion Documents" field).

Prevention of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

Data Abstraction

For each study used to answer the key question (KQ), review team members extracted data about the population, study design, intervention, analysis and results for outcomes of interest. For each study one team member completed full abstraction (study characteristics, risk of bias assessment, outcome data) using electronic forms housed in a web-based systematic review software program. A second team member verified all extracted data and ratings; disagreements were resolved through discussion and/or third party consultation when consensus could not be reached. Prior to performing meta-analyses, tables were produced for each outcome and all data were checked in a third round of verification.

Unadjusted immediate post assessment data was extracted for most studies. However, for a small number of studies the immediate post intervention data was not available. For two studies review team members extracted data at the point closest to the end of the intervention (i.e., nine months after a 12 week intervention, 18 months post baseline for a three-term school-based intervention). One other study reported interim results for longer term interventions (24 month results for a 36 month intervention). Since there was no condition that interventions must be completed to be included in this review, review team members extracted this interim data.

To answer the adverse effects KQ review team members selected the more inclusive option and looked for data for all reported adverse events of interest, regardless of whether they were attributed to study participation.

Assessing Risk of Bias

Arriving at a Grading of Recommendations Assessment, Development and Evaluation or GRADE rating for a body of evidence (see next section) requires a preliminary assessment of the risk of bias or study limitations for the individual studies. All randomized controlled trials (RCTs) included to answer the KQ of this review were assessed using the Cochrane Risk of Bias tool.

Information to determine risk of bias was abstracted from the primary methodology paper for each study and any other relevant published papers. For each study, one team member completed the initial ratings which were then verified by a second person; disagreements were resolved through discussion and/or third party consultation when consensus could not be reached. To assign a high or low risk of bias rating for a particular domain review team members looked for explicit statements or other clear indications that the relevant methodological procedures were or were not followed. In the absence of such details review team members assigned unclear ratings to the applicable risk of bias domains. To determine the overall risk of bias rating for an outcome group review team members considered all domains, however greater emphasis was placed on the assessments of first three areas of randomization, allocation, and blinding of outcome assessment.

Table 1 in the systematic review summarizes the risk of bias ratings applied to the RCTs included in this review.

Assessing Strength or Quality of the Evidence

The strength of the evidence was determined based on the GRADE system of rating the quality of evidence. This system of assessing evidence is widely used and is endorsed by over 40 major organizations including World Health Organization (WHO), Centers for Disease Control and

Prevention (CDC) and the Agency for Healthcare Research and Quality (AHRQ). The GRADE system rates the quality of a body of evidence as high, moderate, low or very low; each of the four levels reflects a different assessment of the likelihood that further research will impact the estimate of effect (i.e., high quality: further research is unlikely to change confidence in the estimate of effect; moderate quality: further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate; low quality: further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate; very low quality: the estimate of effect is very uncertain).

There was no assessment of the quality of the evidence used to answer the contextual questions.

Data Analysis

To perform meta-analyses, immediate post-treatment data (means, standard deviations) were utilized for continuous outcomes such as body mass index (BMI), BMI Z-score (hereafter BMIz), total cholesterol, triglycerides, high density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and systolic and diastolic blood pressure, while number of events data were utilized for binary outcomes (i.e., prevalence of overweight/obesity). For the primary outcome of weight change, review team members took BMI as the primary outcome measure and if BMI was not reported review team members took BMIz. The DerSimonian and Laird random effects model with inverse variance (IV) method was utilized to generate the summary measures of effect in the form of standardized mean difference (SMD) for the primary weight outcome of change in BMI/BMIz and mean difference (MD) for other continuous outcomes. The random effects model assumes the studies are a sample of all potential studies and incorporates an additional between-study component to the estimate of variability. The outcome of change in prevalence of overweight/obesity pre and post intervention as compared to control group was meta-analyzed using the differences in risk ratio (RR) ($RR_{Intervention}$ - $RR_{Control}$) along with its standard error (SE) and the summary measures of effect were generated utilizing the DerSimonian and Laird random effects model with IV method. The absolute numbers and absolute risk reduction (ARR) were based on prevalence of overweight/obesity at post-intervention. Review team members added the estimate of ARR and number needed to treat (NNT) to the GRADE table. The NNT was calculated using the absolute number presented in the GRADE table. GRADE estimates the absolute number per million using the control group event rate and RR with the 95% confidence interval (CI) obtained from the meta-analysis.

Sensitivity analyses were performed to evaluate statistical stability and effect on statistical heterogeneity. The sub-group analyses based on age groups (0 to 5, 6 to 12, and 13 to 18 years), type of intervention (diet, exercise, diet plus exercise, lifestyle), intervention setting (non-education, education only, and education plus other settings) length of intervention (≤12 months, >12 months), gender, and study risk of bias rating (low, unclear, high) were performed for change in BMI/BMIz because this was an outcome that most of the studies reported and, to be consistent, this was the outcome used for sensitivity analyses in the companion review on treatment interventions.

Meta-analyses were performed using Review Manager version 5.1 software. The Egger's test for publication bias for each outcome was conducted using STATA version 12.

See the systematic review for more details on the data analysis.

Treatment of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

Data Abstraction

For each study used to answer the KQs, review team members extracted data about the population, study design, intervention, analysis and results for outcomes of interest. For each study one member completed full abstraction (study characteristics, risk of bias assessment, outcome data) using electronic forms housed in a web-based systematic review software program. A second member verified all extracted data and ratings; disagreements were resolved through discussion and/or third party consultation when consensus could not be reached. Prior to performing meta-analyses, tables were produced for each outcome and all data were checked in a third round of verification.

Unadjusted immediate post assessment data was extracted for most studies. However, for eight studies the immediate post intervention data was not reported in the available papers or the interventions lasted less than six months and the inclusion criteria required outcome assessment at a minimum of six months post baseline. For these studies review team members extracted data at the point closest to the end of the intervention and at least six months post baseline assessment to use for the KQ1 analyses (e.g., one month after a five month intervention, three months after a three month intervention, four months after a four month intervention). Some papers reported relevant follow-up data that was extracted for the KQ2 analyses.

To answer the adverse effects KQ review team members selected the more inclusive option and looked for data for all reported adverse events of interest, regardless of whether they were attributed to study participation. In addition, for the meta-analyses review team members only included mutually exclusive adverse events data, that is, review team members selected results that reported the number of participants who experienced at least one event in the respective overall adverse effects category. The results from studies that reported the total number of adverse events

experienced across all study group participants are captured only in the narrative results of this review.

Assessing Risk of Bias

Arriving at a GRADE rating for a body of evidence (see next section) requires a preliminary assessment of the risk of bias or study limitations for the individual studies. All RCTs included to answer the KQs of this review were assessed using the Cochrane Risk of Bias tool.

Information to determine risk of bias was abstracted from the primary methodology paper for each study and any other relevant published papers. For each study, one team member completed the initial ratings which were then verified by a second person; disagreements were resolved through discussion and/or third party consultation when consensus could not be reached. To assign a high or low risk of bias rating for a particular domain review team members looked for explicit statements or other clear indications that the relevant methodological procedures were or were not followed. In the absence of such details review team members assigned unclear ratings to the applicable risk of bias domains. To determine the overall risk of bias rating for an outcome group review team members considered all domains, however greater emphasis was placed on the assessments of the first three areas of randomization, allocation, and blinding of outcome assessment.

Table 1 in the systematic review summarizes the risk of bias ratings applied to the RCTs included in this review.

Assessing Strength or Quality of the Evidence

The strength of the evidence was determined based on the GRADE system of rating the quality of evidence. This system of assessing evidence is widely used and is endorsed by over 40 major organizations including WHO, CDC and AHRQ. The GRADE system rates the quality of a body of evidence as high, moderate, low or very low; each of the four levels reflects a different assessment of the likelihood that further research will impact the estimate of effect (i.e., high quality: further research is unlikely to change confidence in the estimate of effect; moderate quality: further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate; low quality: further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate; very low quality: the estimate of effect is very uncertain).

There was no assessment of the quality of the evidence used to answer the contextual questions.

Data Analysis

To perform meta-analyses, immediate post-treatment data (means, standard deviations) were utilized for continuous outcomes such as BMI, BMIz, total cholesterol, triglycerides, HDL-C, LDL-C, and systolic and diastolic blood pressure, while number of events data were utilized for binary outcomes (i.e., prevalence of overweight/obesity, adverse events). For the primary outcome of weight change, review team members took BMI as the primary outcome measure and if BMI was not reported review team members took BMIz. The DerSimonian and Laird random effects model with IV method was utilized to generate the summary measures of effect in the form of SMD for the primary weight outcome of BMI/BMIz and MD for other continuous outcomes. The random effects model assumes the studies are a sample of all potential studies and incorporates an additional between-study component to the estimate of variability. The outcome of change in prevalence of overweight/obesity at post-intervention as compared to control group was meta-analyzed using the number of events data at post-intervention and the summary measures of effect were generated as a RR utilizing the DerSimonian and Laird random effects model with IV method. If the pooled effect estimate was significant review team members planned to calculate the ARR and the NNT.

Sensitivity analyses were performed to evaluate statistical stability and effect on statistical heterogeneity. The sub-group analyses based on primary focus of intervention (behavioural, pharmacological plus behavioural), type of behavioural intervention (diet, exercise, diet plus exercise, lifestyle), intervention duration (≤12 months, >12 months), age groups (2 to 12 years, 13 to 18 years), intervention target (individual, families) and study risk of bias rating (low, unclear, high) were performed for BMI/BMIz because this was an outcome that most of the studies reported and, to be consistent, this was the outcome used for sensitivity analyses in the companion review on prevention interventions. Only primary focus of intervention (behavioural, pharmacological plus behavioural) was used to conduct sensitivity analyses across other outcomes.

For significant adverse effects outcomes reviewers added absolute risk increase (ARI) and number needed to harm (NNH) to the GRADE tables. They calculated NNHs using the absolute numbers presented in the GRADE tables. GRADE estimates the absolute number per million using the control group event rate and RR with the 95% CI obtained from the meta-analysis.

Meta-analyses were performed using Review Manager version 5.1 software. The Egger's test for publication bias for each outcome was conducted using STATA version 12.

See the systematic review for more details on the data analysis.

Methods Used to Formulate the Recommendations

Other

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): Two systematic evidence reviews were prepared by the McMaster Evidence Review and Synthesis Centre Team for the Canadian Task Force on Preventive Health Care (CTFPHC) (see the "Availability of Companion Documents" field).

The CTFPHC is an independent panel of clinicians and methodologists that makes recommendations about clinical manoeuvres aimed at primary and secondary prevention. Work on each set of recommendations is led by a working group of 2 to 6 members of the Task Force. Each working group establishes the research questions and analytical framework for the guideline.

The development of these recommendations was led by a Task Force workgroup, in collaboration with scientific staff from the Public Health Agency of Canada (authors of the guideline are listed at the end of the article.) A clinical expert (pediatric endocrinologist) was consulted throughout the process.

Prevention of Overweight and Obesity

Analytic Framework and Key Questions

The key question (KQ) and sub-questions considered for this prevention focused review are:

KQ1. Do primary care relevant prevention interventions (behaviourally based) in healthy weight children lead to improved health outcomes or sustained/short-term healthy body mass index (BMI) trajectories?

a. How well are healthy BMI trajectories or health outcomes maintained after an intervention is completed?
b. What are common elements of effective interventions for healthy BMI trajectories?
c. Does the effectiveness of interventions vary between child subgroups (e.g., infants versus children or adolescents, sex, race-ethnicity, baseline cardiovascular risk status, low socioeconomic status [SES], parental history of obesity, maternal cigarette smoking in pregnancy, maternal diabetes, low birth weight, formula feeding)?
d. What are the adverse effects of primary care-relevant prevention in healthy weight children (e.g., disordered eating, psychological distress such as anxiety, micronutrient deficits, abnormal growth trajectory, or growth restriction)?
e. Are there differences in adverse effects between child subgroups (e.g., infants versus children and adolescents, sex, race-ethnicity, baseline cardiovascular risk status, low SES, parental history of obesity, maternal cigarette smoking in pregnancy, maternal diabetes, low birth weight, formula feeding)?

The supplemental questions (SQs) on obesity screening considered for both the prevention and the treatment reviews are:

SQ1. Does screening for overweight and obesity in children and youth in primary care practice reduce the risk of morbidity and mortality and/or improve health outcomes (impaired glucose tolerance, type 2 diabetes [T2D], hypertension, dyslipidemia, non-alcoholic fatty liver disease, sleep apnea, slipped capital femoral epiphysis and psychosocial disorders)?

a. Does screening for overweight/obesity in children and youth result in reduction or stabilization of adiposity?
b. What is the most effective method of screening for overweight and obesity in children in primary care?
c. What is the optimal interval/frequency for screening for overweight and obesity in children in primary care?
d. What is the most effective type of screening (opportunistic vs. organized/systematic) for overweight and obesity in children in primary care?
e. What are the harms associated with screening for overweight and obesity in children in primary care?
f. Do screening interventions decrease mortality and incidence of health outcomes in high risk groups such as but not limited to those with a family history of obesity, psychological issues or co-morbid conditions?

Management of Overweight and Obesity

Analytic Framework and Key Questions

The KQs and sub-questions considered for this management focused review are:

- KQ1. Do weight management programs (behavioural, combined behavioural, pharmacological and surgical interventions) lead to BMI,

weight, or adiposity stabilization or reduction in children and adolescents who are obese or overweight?
    a. Do these weight management programs lead to other positive outcomes (e.g., improved behavioural or physiological measures, decreased childhood morbidity, improved childhood functioning, or reduced adult morbidity and mortality)?
    b. Do specific components of the weight management programs influence the effectiveness of the programs?
    c. Are there population (e.g., age, sex, race-ethnicity, low SES, parental history of obesity, maternal cigarette smoking in pregnancy, maternal diabetes, low birth weight, formula feeding) or environmental factors that influence the effectiveness of the weight management programs?
    d. What are the adverse effects of weight management programs (behavioural, combined behavioural, and pharmacological) attempting to stabilize or reduce BMI?
    e. Are there differences in adverse effects between child subgroups (e.g., age, sex, race-ethnicity, low SES, severity of obesity, parental history of obesity, maternal cigarette smoking in pregnancy, maternal diabetes, low birth weight, formula feeding)?
- KQ2. Do weight management programs (behavioural, combined behavioural and pharmacological or surgical) help children and adolescents who are initially obese or overweight maintain BMI, weight, or adiposity improvements after the completion of an active intervention?
    a. Do these weight management programs lead to other positive outcomes (e.g., improved behavioural or physiological measures, decreased childhood morbidity, improved childhood functioning, or reduced adult morbidity and mortality)?
    b. Do specific components of the weight management programs influence the effectiveness of the programs?
    c. Are there population (e.g., age, sex, race-ethnicity [e.g., Canadian Aboriginal youth], lower SES, parental history of obesity, maternal cigarette smoking in pregnancy, maternal diabetes, low birth weight, formula feeding) or environmental factors that influence the effectiveness of the weight management programs?
    d. What are the adverse effects of weight management programs (behavioural, combined behavioural, surgical and pharmacological) attempting to stabilize or maintain BMI?
    e. Are there differences in adverse effects between subgroups (e.g., age, sex, race-ethnicity, low SES, parental history of obesity, maternal cigarette smoking in pregnancy, maternal diabetes, low birth weight, formula feeding)?

Grading of Recommendations

Recommendations are graded according to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system, which offers two strengths of recommendation: strong and weak. The strength of recommendations is based on the quality of supporting evidence, the degree of uncertainty about the balance between desirable and undesirable effects, the degree of uncertainty or variability in values and preferences, and the degree of uncertainty about whether the intervention represents a wise use of resources.

Rating Scheme for the Strength of the Recommendations

Grading of Recommendations

- Strong recommendations are those for which the Task Force is confident that the desirable effects of an intervention outweigh its undesirable effects (strong recommendation for an intervention) or that the undesirable effects of an intervention outweigh its desirable effects (strong recommendation against an intervention). A strong recommendation implies that most people will be best served by the recommended course of action.
- Weak recommendations are those for which the desirable effects probably outweigh the undesirable effects (weak recommendation for an intervention) or undesirable effects probably outweigh the desirable effects (weak recommendation against an intervention) but appreciable uncertainty exists. A weak recommendation implies that most people would want the recommended course of action, but many would not. For clinicians, this means they must recognize that different choices will be appropriate for each individual, and they must help each person arrive at a management decision consistent with his or her own values and preferences. Policy-making will require substantial debate and involvement of various stakeholders. Weak recommendations result when the balance between desirable and undesirable effects is small, the quality of evidence is lower, or there is more variability in the values and preferences of patients.

Cost Analysis

Economic implications

The Task Force did not consider the economic implications of these interventions in the development of the guideline.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The recommendations were revised and approved by the entire Task Force and underwent external review by experts in the field and by stakeholders.

Table 2 in the original guideline document provides a comparison between the current and previous Task Force guidelines, as well as recommendations from other groups.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Prevention of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

The available evidence was indirect and insufficient to determine whether these interventions are associated with clinically important harms. In making this recommendation, the Task Force is placing a high value on the lack of evidence for clinically important benefit of current interventions to prevent overweight and obesity in the target population, the lack of evidence that any benefits are sustained in the long term, and the lack of evidence for the use of such interventions in primary care settings.

Treatment of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

- The evidence presented in the systematic review supports the conclusion that behavioural interventions for treating overweight/obesity in children and youth are associated with a short-term treatment effect in terms of lowered body mass index/body mass index Z-score (BMI/BMIz) as compared to a small treatment effect shown by combined pharmacological (orlistat) and behavioural interventions.
- Behavioural interventions have shown short-term effectiveness in reducing BMI in overweight or obese children and youth, and are the preferred option, because the benefit-to-harm ratio appears more favourable than for pharmacologic interventions.
- Pharmacologic interventions in addition to a healthy nutrition and exercise intervention show modest short-term benefit for adolescents, but have frequent harms.

Potential Harms

Prevention of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

- Pharmacotherapy and surgical interventions have been identified more recently as being efficacious but these approaches are only recommended in restricted populations after other weight loss strategies have been attempted and they are not without consequences.
- The benefits of program participation must be considered in light of any harm induced by or associated with the intervention. As expected, very few included studies (3/90) reported on adverse effects. One study found no evidence of negative impacts on students' body image and a second study affirmed that the intervention was delivered without any major incidents. The third study, which examined the effects of an

after school physical activity program on more than 500 elementary school children, reported 43 adverse events over the three year intervention period, 67% were described as mild in nature, 21% were moderate and 12% were severe.

Treatment of Overweight/Obesity in Children and Youth: a Systematic Review with Meta-Analyses

Intervention participants in a pharmacological plus behavioural study were significantly more likely to report experiencing gastrointestinal symptoms (e.g., bloating and diarrhea) as compared to the control group (relative risk/risk ratio [RR] [95% confidence interval (CI)] 3.77 [2.56, 5.55]).

Qualifying Statements

Qualifying Statements

The views of the funding bodies have not influenced the content of the guideline; competing interests have been recorded and addressed. The views expressed in this article are those of the authors and do not represent those of the Public Health Agency of Canada.

Gaps in Knowledge

This guideline highlights an important gap in the research literature on the prevention of obesity in primary care–relevant settings. No identified trials focused exclusively on helping healthy-weight children and youth to maintain their healthy weight status or exploring the potential harms and unintended consequences of preventive interventions. More research is needed in primary care settings to determine the best way for primary care practitioners to be involved in obesity-prevention efforts. In particular, the first year of a child's life, when frequent primary care contact occurs, may provide an opportunity for targeted interventions for obesity prevention. Existing limited evidence highlights the potential for developing effective interventions in this area, but more research is needed. Further research is also needed examining the long-term effect of interventions delivered in a school-based setting and the potential involvement of primary care practitioners.

More studies are also needed to better understand the preferences of parents and children regarding preventive interventions for those currently at a healthy weight, including the most effective and least harmful method for discussing with the parents the health risks of interventions for overweight and obesity prevention. Given the limitations of the evidence, no performance indicators were developed.

More research is needed on the long-term benefits or harms of programs for weight management in children and adolescents. Research examining the effectiveness of weight-management programs based on patient and parent characteristics, including age, sex, body mass index (BMI) classification and socioeconomic status (SES) are also needed. Future studies should test for effect modifiers of the benefits of behavioural and pharmacologic treatment on weight management, especially characteristics that can be identified easily in clinical practice.

Although monitoring height, weight and BMI will continue to be common practices for growth monitoring, studies examining the effectiveness of BMI measurement as a screening practice should be conducted.

Implementation of the Guideline

Description of Implementation Strategy

Considerations for Implementation

The Task Force has developed a series of tools to help practitioners interpret these recommendations for their patients, which can be found at canadiantaskforce.ca/ctfphc-guidelines/2015-obesity-children. The Task Force uses a rigorous and collaborative usability testing process to develop knowledge translation tools targeting various end-user groups (e.g., clinicians and patients) to accompany its guidelines. All tools are informed by feedback from clinicians (for clinician and patient tools) and patients (for patient tools) obtained through interviews and/or focus groups.

Values and Preferences

No information was identified that discussed the values and preferences of parents or children and youth for receiving preventive interventions. The evidence review on prevention of overweight and obesity suggests that understanding barriers to participation in physical activities can help practitioners to devise effective strategies for engaging children and youth in such activities.

There was insufficient evidence to assess patient values and preferences regarding interventions for weight management. The evidence review on management of overweight and obesity highlighted the importance of supportive relationships between practitioners and families to help patients achieve healthy weight goals and the need for practitioners to understand barriers to participation in weight-management activities.

Other Considerations

There is increasing interest in opportunities for preventive interventions in a child's early period of growth and development, which coincides with frequent contact with primary care. The evidence review on prevention of overweight and obesity identified three studies that focused on interventions initiated in the first year of life. Wen and colleagues conducted a trial of eight home visits by community nurses (education sessions on healthy infant-feeding practices and active play) beginning antenatally through to 24 months after birth, with outcomes reported at 24 months. Daniels and colleagues conducted a trial of multiple group sessions co-led by a dietitian and psychologist (comprehensive skills-based program on feeding and parenting practices) beginning at four to six months, with outcomes reported at 13 to 15 months. Campbell and colleagues conducted a trial of multiple group sessions led by a dietitian (diet counselling) beginning at four months, with outcomes reported at 20 months. Two studies showed a statistically significant reduction in body mass index (BMI) and body mass index Z-scores (BMIz) in the intervention groups, and one study did not. A meta-analysis of the three studies, with a total sample of 857, showed a statistically significant lower BMI and BMIz (standardized mean difference [SMD] –0.13, 95% confidence interval [CI] –0.25 to –0.02) in the intervention participants as compared with the control participants, but the magnitude of the effect was very small. The results of this meta-analysis will be included in an addendum to the full technical report that will be published on www.canadiantaskforce.ca the day of this guideline's publication.

In the literature update to January 10, 2015, the Evidence Review and Synthesis Centre identified 18 new randomized controlled trials (RCTs) that examined the effectiveness of preventive interventions and could be pooled for analysis. The updated analysis showed a statistically significant reduction in BMI in children five years of age and younger who participated in the intervention group (SMD –0.12, 95% CI –0.21 to –0.02), but the magnitude of the effect was very small. The first five years of life in a child, and in particular the first 12 months, may provide an opportunity for targeted interventions for obesity prevention, although further research is needed.

The Task Force recognizes the importance of growth monitoring in early childhood, and the as-yet unproven potential for primary preventive interventions in children less than two years of age. This guideline did not examine the management of overweight and obesity in this age group.

The Task Force sought but found no evidence that the benefits and harms of intervention for overweight and obesity varied in accordance with patient and parent characteristics, including age, sex and socioeconomic status (SES). Additionally, provider skills and intervention formats varied widely. Therefore, only general aspects of the effective interventions could be identified. Resources for offering the most effective interventions are more likely to be found in team-based primary care settings. Emphasis should be placed on the delivery of comprehensive weight-management programs by a specialized interdisciplinary team. Primary care practitioners who wish to partake in the delivery of such programs should receive adequate training.

Finally, the Task Force recognizes that implementation of these recommendations is in part dependent on the availability of formal, structured behavioural interventions for weight management in children and youth in Canadian settings, and that regional differences in availability of health services may exist. Canada's federal, provincial and territorial governments are coordinating efforts with health services organizations and various sectors to deliver joint initiatives that will help address child obesity. These initiatives target children, families, communities, and the broader environmental and social determinants of childhood obesity. Clinicians interested in learning more about the type of interventions that are currently available in each region may consult the 2013 Progress Report on Advancing the Federal/Provincial/Territorial Framework on Healthy Weights (www.phn-rsp.ca/thcpr-vcpsre-2013/images/Compilation-of-Initiatives-EN.pdf). Where such interventions are not yet available, primary care practitioners and policy makers should consider their development a priority.

Implementation Tools

Foreign Language Translations

Mobile Device Resources

Quick Reference Guides/Physician Guides

Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Canadian Task Force on Preventive Health Care. Recommendations for growth monitoring, and prevention and management of overweight and obesity in children and youth in primary care. CMAJ. 2015 Apr 7;187(6):411-21. [37 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2015 Apr 7

Guideline Developer(s)

Canadian Task Force on Preventive Health Care - National Government Agency [Non-U.S.]

Source(s) of Funding

Funding for the Canadian Task Force on Preventive Health Care (CTFPHC) is provided by the Public Health Agency of Canada and the Canadian Institutes of Health Research.

Guideline Committee

Canadian Task Force on Preventive Health Care (CTFPHC) Guideline Workgroup

Composition of Group That Authored the Guideline

Group Members: Patricia Parkin MD, Department of Paediatrics, University of Toronto, Toronto, Ont.; Sarah Connor Gorber PhD, Public

Health Agency of Canada, Ottawa, Ont.; Elizabeth Shaw MD, Department of Family Medicine, McMaster University, Hamilton, Ont.; Neil Bell MD, Department of Family Medicine, University of Alberta, Edmonton, Alta.; Alejandra Jaramillo MSc, Public Health Agency of Canada, Ottawa, Ont.; Marcello Tonelli MD, Office of the Associate Dean (Research), University of Calgary, Calgary, Alta.; Paula Brauer PhD, Family Relations and Applied Nutrition, University of Guelph, Guelph, Ont.

Financial Disclosures/Conflicts of Interest

The views of the funding bodies have not influenced the content of the guideline; competing interests have been recorded and addressed.

Competing interests: None declared.

Guideline Endorser(s)

College of Family Physicians of Canada - Professional Association

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Electronic copies: Available from the Canadian Task Force on Preventive Health Care (CTFPHC) Web site.

Print copies: Available from the Canadian Task Force on Preventive Health Care 3050 RTF, University of Alberta, Edmonton, AB, T6G 2V2, Canada.

Availability of Companion Documents

The following are available:

- Prevention of overweight/obesity in children and youth: a systematic review with meta-analyses. Hamilton (ON): Evidence Review and Synthesis Centre, McMaster University; 2014 Jun. 224 p. Electronic copies: Available from the Canadian Task Force on Preventive Health Care (CTFPHC) Web site.
- Prevention of overweight/obesity in children and youth: a systematic review with meta-analyses. Childhood obesity KQ1 prevention excluded studies list. Hamilton (ON): Evidence Review and Synthesis Centre, McMaster University; 2014 Jun. 22 p. Electronic copies: Available from the CTFPHC Web site.
- Treatment of overweight/obesity in children and youth: a systematic review with meta-analyses. Hamilton (ON): Evidence Review and Synthesis Centre, McMaster University; 2014 Jun. 226 p. Electronic copies: Available from the CTFPHC Web site.
- Treatment of overweight/obesity in children and youth: a systematic review with meta-analyses. Childhood obesity KQ2 treatment excluded studies list. Hamilton (ON): Evidence Review and Synthesis Centre, McMaster University; 2014 Jun. 18 p. Electronic copies: Available from the CTFPHC Web site.
- Recommendations for growth monitoring, and prevention and management of overweight and obesity in children and youth in primary care. Online appendices 1-3. Ottawa (ON): Canadian Task Force on Preventive Health Care; 2015. Electronic copies: Available from the Canadian Medical Association Journal (CMAJ) Web site.
- Primary and secondary prevention of overweight/obesity in children and youth. Protocol. Ottawa (ON): Canadian Task Force on Preventive Health Care; 2013 Feb. 26 p. Electronic copies: Available from the CTFPHC Web site.
- Child obesity prevention and management: recommendation table. Ottawa (ON): Canadian Task Force on Preventive Health Care; 2015. 2 p. Electronic copies: Available in English and French from the CTFPHC Web site.
- CTFPHC recommendation for prevention and management of child obesity. Clinician summary. Ottawa (ON): Canadian Task Force on

Preventive Health Care; 2015. 1 p. Electronic copies: Available in English and French from the CTFPHC Web site.

- Obesity in children—CMAJ author podcast. Ottawa (ON): Canadian Task Force on Preventive Health Care; 2015. Available from the CTFPHC Web site.
- Recommendations for growth monitoring, and prevention and management of overweight and obesity in children and youth in primary care. CME course. Ottawa (ON): Canadian Task Force on Preventive Health Care; 2015. Electronic copies: Available from the CMAJ Web site.
- Canadian Task Force on Preventive Health Care procedure manual. Ottawa (ON): Canadian Task Force on Preventive Health Care; 2014 Mar. 83 p. Electronic copies: Available from the CTFPHC Web site.
- Grades of recommendation, assessment, development, and evaluation (GRADE) companion document. Ottawa (ON): Canadian Task Force on Preventive Health Care; 2011. 2 p. Electronic copies: Available in English and French from the CTFPHC Web site.

There is a CTFPHC mobile app for primary care practitioners available for download from the CTFPHC Web site.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on May 29, 2015. The information was verified by the guideline developer on August 19, 2015.

Copyright Statement

Disclaimer

NGC Disclaimer